2025

BBCHAIN

Blockchain & Digital Assets

Project Ptah

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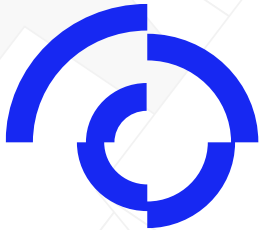
The future is a moving target



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Rodrigo Bueno (CTO)

Co-founder:

Specialist in distributed computing and Big Data; Blockchain solutions architect in Brazil; Architecture and code contributor of Corda; First Blockchain Corda certificate in Brazil.

André Carneiro (CEO)

Co-founder:

Specialist in Blockchain Business Architecture at Itaú;
+20 years of technologies in the financial sector;
MBA in Finance from FIA/USP with extension from the University of La Verne in California
Graduate in Information Systems

João Aragão , PhD

Subject Matter Expert in technology, FSI and innovation, Multi-Agent Systems, CBDC strategist, business advisor, Mentor, Postdoc candidate (Multi-Agents, blockchain, AML), PhD (AI/ML and healthcare), MSc. (AI/ML and security at Inter bank

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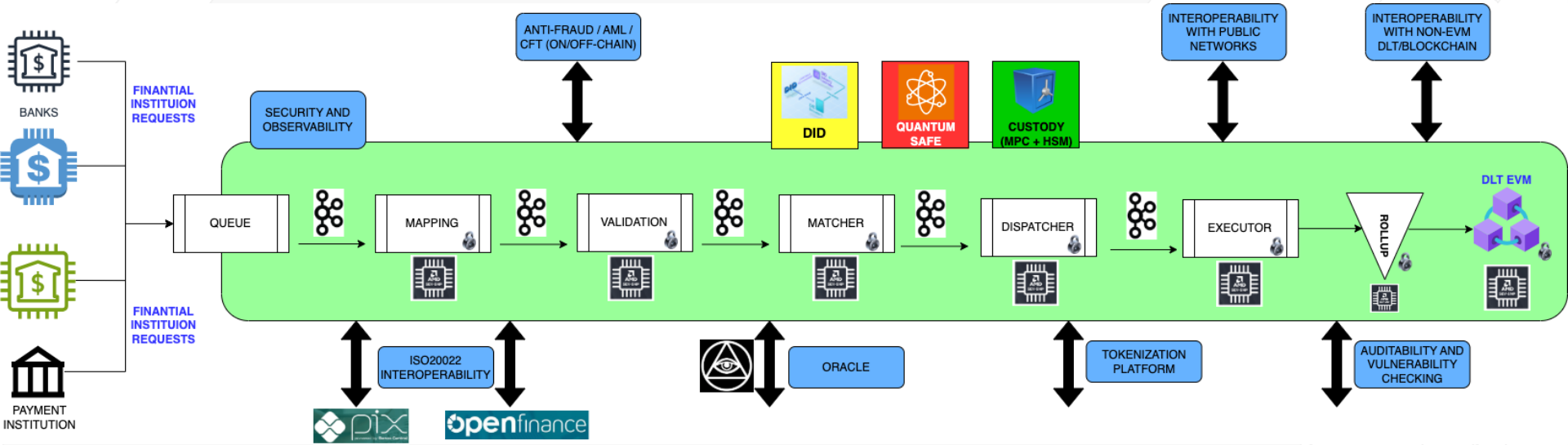
Zero Trust



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Hyperledger Fabric

Cryptographic journey

Stablecoins

Paladin

FAULT-TOLERANCE

CBDC

Cryptocurrencies

COMPARTMENTALIZATION

PRIVACY

Ptah by BBCHAIN

ORCHESTRATION

Wallets

Interoperable DLT

Central Banks Requirements

Tokenization

Governance

Custody integration

LAYER 2

LFDT Besu interoperability

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Ptah by BBCHAIN Paper

Applying a Distinguished Framework to Ensure Privacy-by-Design and Composability in a Regulated Tokenized Multi-Asset Network

Rodrigo Gonçalves Bueno*, André Carneiro†, João Paulo Aragão Pereira, PhD‡

Applying a Distinguished Framework to Ensure Privacy-by-Design and Composability in a Regulated Tokenized Multi-Asset Network

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Abstract

The increasing adoption of tokenized assets, Decentralized Finance (DeFi) applications, and the exploration of Central Bank Digital Currencies (CBDCs) necessitate sophisticated security architectures for Regulated Tokenized Multi-asset Networks (RTMNs). This paper addresses the complex interplay between privacy, and composability within these emerging decentralized financial ecosystems. It is argued that conventional security paradigms, predominantly reliant on perimeter defenses, are insufficient for the distributed and interconnected nature of DeFi infrastructures. While Zero Trust models offer relevant principles, their direct application within regulated, high-performance financial networks, particularly those involving CBDCs or complex DeFi protocols, presents significant challenges regarding compliance and efficiency. This paper introduces a novel framework meticulously designed to support diverse RTMN use cases, including retail/wholesale CBDC, tokenized deposit, stablecoin and multi-asset platforms operating within a DeFi context. A foundational element of this framework is the implementation of cryptographically enforced information compartmentalization. This ensures that each architectural component operates with the minimum necessary information required for its specific function, inherently embedding privacy-by-design and preventing unauthorized access to comprehensive network or transactional data. The proposed framework is architected to guarantee critical properties essential for robust decentralized systems: (1) Atomicity of transactions; (2) Composability and Programmability; (3) Settlement Finality, providing transaction immutability; (4) Enhanced Privacy and Security, leveraging cryp-

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Objective:

structure a multi-asset network with governance and privacy in a distributed, diverse and global settlement infrastructure with privacy, based on proof of reserve [stablecoin]

Parceiros:

ABBC

IBM Business Partner

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Phase 2 DREX

1) Trade Finance
2) Credit Notes
3) Debentures

Testado na segunda fase do Drex
e selecionado no Lift Lab 2025

DREX 2ª fase | LIFT LAB | Coordenação: BANCO CENTRAL DO BRASIL | FENASBAC

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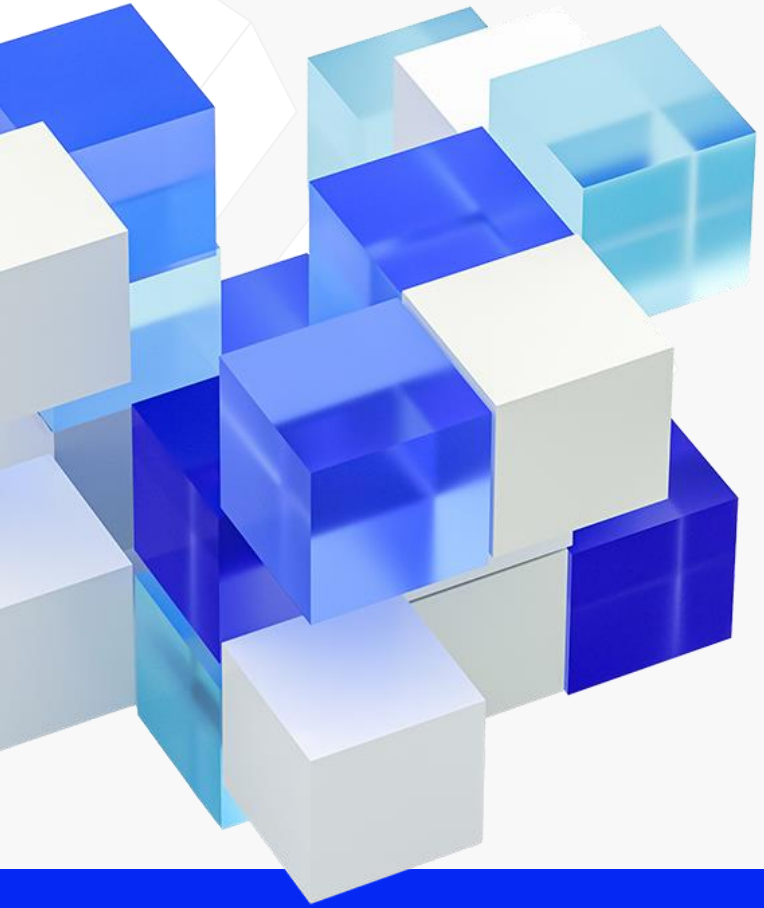

Project Ptah by BBCHAIN

Ptah, as a distributed computing approach, seeks to balance the trilemma of **privacy, decentralization and programmability**. Additionally, **interoperability, governance** applied to a regulated, normative and constantly changing world.

Asymmetries:
- Financial market [IP x Commercial Bank]
- Information [Privacy/Regulation]
- SLA [different types of products]

Interoperability:

- Traditional financial market < > Drex < > OnChain < > DeFi

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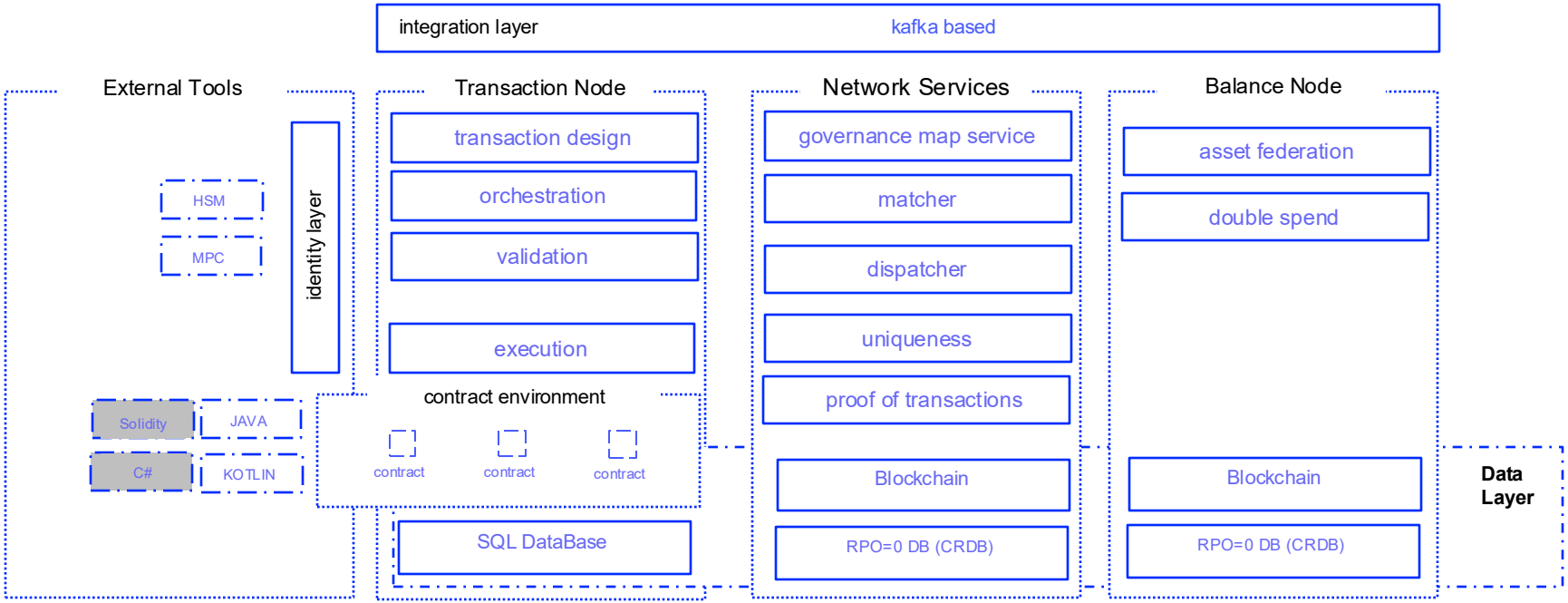
Blueprint



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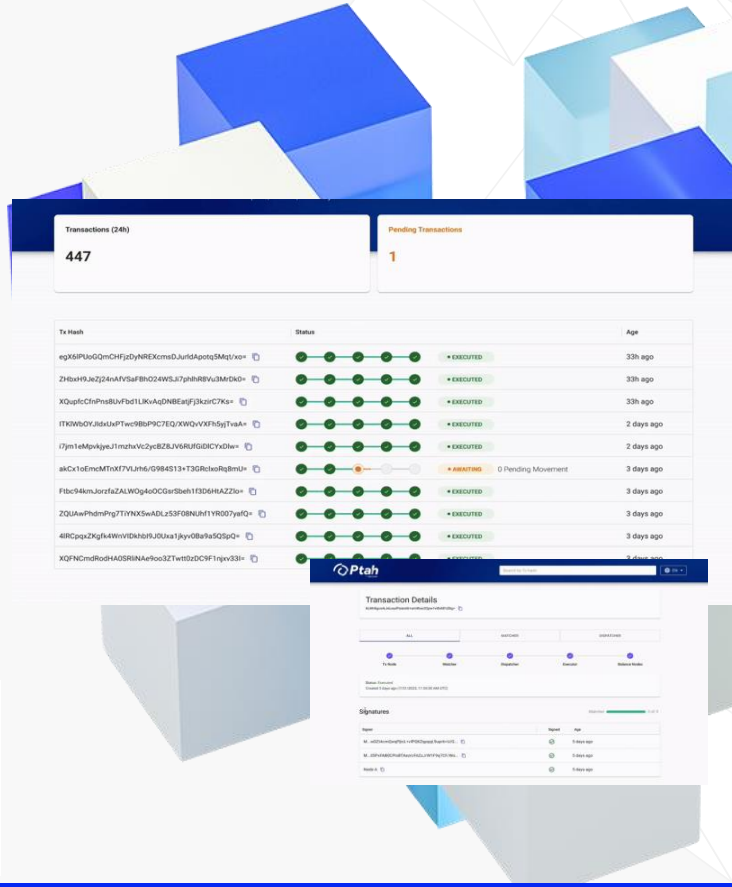
Ptah by BBCHAIN — Fundamentals

- **Existing infrastructure:** Currently the market has an existing infrastructure built over decades formed by reliable partners.
- **Compartmentalization:** Separation of systems or processes to improve security, efficiency or organization offering privacy by design.
- **Distributed Computing:** Inspiration from already consolidated Big Data systems, using their techniques to guarantee high performance and availability.

Main Features
- Scalability
- Reliability
- Parallelism
- Privacy
- Interoperability

Pilars
- Nodes
- Communication
- Coordination
- Compartmentalization
- Orchestration

Advantages
- Performance
- Fault Tolerance
- Flexibility
- Cost-effectiveness



Partners:

More about BBChain Ptah

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How it Works

Ptah by BBCHAIN

Governance Service

- **Privacy**
- **Programmability**
- **Composability**
- **I.P.**

#tr1 cypher(movimentos[1-2])

- Privacy
- Zero Trust
- **Identity**
- **Non-Repudiation**
- **Compartmentalization**

Transaction Node
IF A

#tr1 Hash Signatures

#tr1 Hash Signatures

Transaction Node
IF B

MATCHER

#tr1 Hash Signatures

- Privacy
- Zero Trust
- **Compartmentalization**

DISPATCHER

#tr1 cypher(movimentos[3-4])

TRANSACTION POOL

IF A

IFD

- *Privacy*
- **Scalability**

Balance nodes

- Privacy
- Scalability
- **Interoperability**
- **2-Phase Commit Atomicity**

pix

HYPERLEDGER BESU

ethereum

Proof of Transaction

HYPERLEDGER BESU

ethereum

- Privacy • **Finality** • **Broadcast**

Programmability & Composability — **Privacy and Non-Repudiation** — crypto journey — **Scalability** — **Interoperability** — **Finality**

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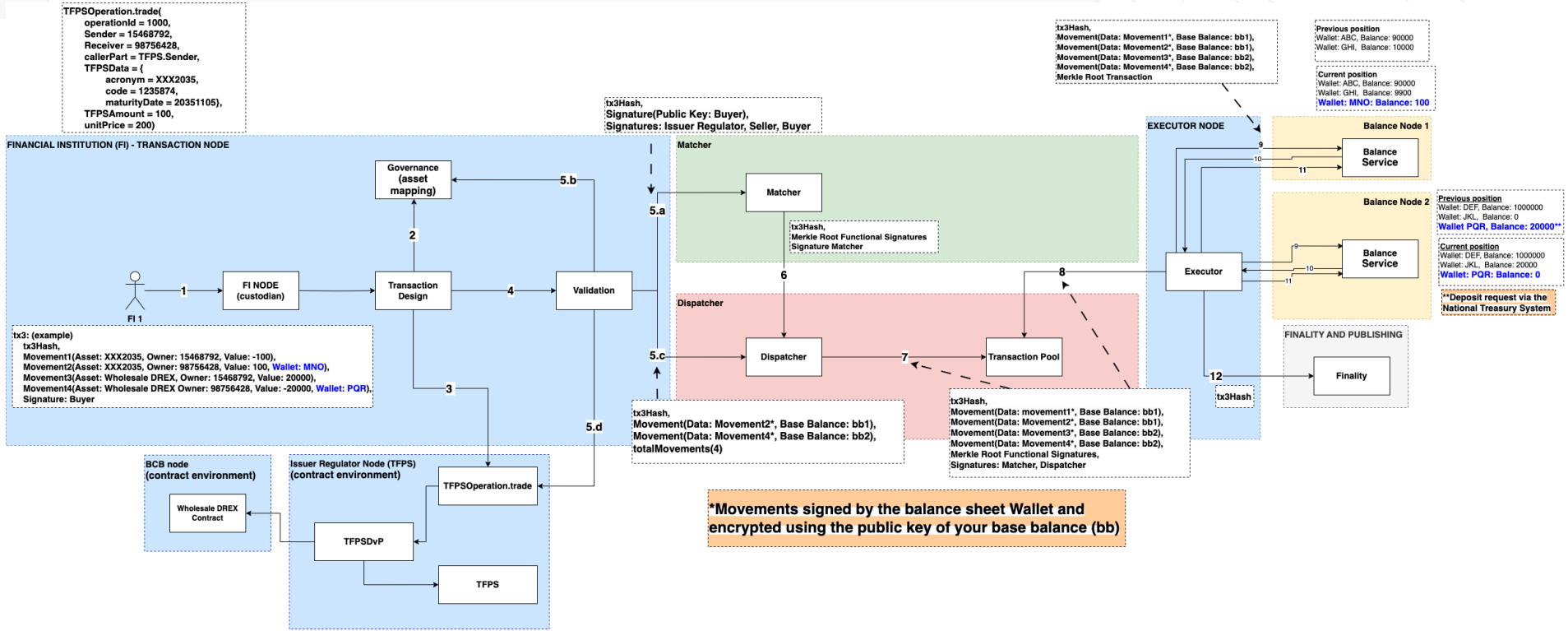
Transaction Sequence



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Ptah Explorer

Ptah by BBCHAIN

Node

Transaction Details

qrbokVnsKkDnMgtN5IhNoEC+RgwoQb0ky/KG+btzgME=

Tx Node → Sent to Matcher → Sent to Dispatcher → Finality Confirmed

Status: EXECUTED
Created 1h ago (9/2/2025, 6:34:27 PM UTC)

Signatures

Matcher 0 of (

Signer	Signed	Age

Movements

Dispatcher 9 of 9

Movement	Balance Node	Sent for Dispatcher	Last Update
#0	M...w5waZQ...	✓	1h ago

Balance Node

MIIBIjANBgkqhkiG9w0BAQEFAAOCAQ8AMIIBCgKCAQEAw5waZQGQlr2/5UJD+ZLWRf6DdS5vOmmDfl5ul6r/2EkkDLtQ5ULBX/VaYov5k/muJldSIOFC/Z9EmDO/pjWBLRnmBroOZh7Yj92mwISzS1oqXvRd1zR5lGcNehKL5r2fdE5J2H4VA15dzOQYTwDit2sJexxqG513eDzPhW9AiFn8FjiZ3vrQe9Obxx2qbVXBfPpYT2rb7DwPOSzRW/Ijl6nN+q+Qcv1JvFlylBwQVJzwYz34Glrk9elVbLVtH6WO138+y7BUVv/iG6dy+X0XVwhE8gKyFKjy6Mb2U+nDg4zhWUT4Bj+QGk5DCqbuzXKDvLhlnkPgYEWS5LBkGBw38wIDAQAB

Created at

9/2/2025, 6:34:27 PM UTC

Encrypted Data

```
48ERC2jhcr7MK1xTkEl//EdaB9c44DcKonCdMI4rdoZ6oipTAWGy+j7GeQbRnSV1KkZ6y2TJki8D29vOdIKxxCjwNDTNIIFoD4YAmH+sJixCLCXYX9Zwa6sIT5FGGxKU6mM6q4KISyESF7zggwva8uKulOAFWYiRqteVkSMJJX8HwxOyP/pUKH+XpUXfQrQ/hhgLy469Z02BS8hKCb/mQF2CfcRKlcx+Nb0Tf03EcCoMq+G1HB8KE99iNiHq8SVzAQFetKSYf47m19pevKehcFUCj6FMmIR2J1yzZ3S84x/GKjaOO1j/DuD+SqHYgZGt117v/dbqs8gyT84iPkD659hJsopkLURtuCW1TQa4gQAgIpKy9irbnQV2Tl8Mg79cE/WedDN13UxWF9seNtoJcOFI+qUoC/Xi6MkH9beArEm/hQofndsVTKGcjpjb9YWogdTcUbqDXUf8r4qOaAiWvLy0q51T7/u0FUoGlprWPdAlsup9h0ByBV0XSunnAlL3OCms24wi82Fb8ZbWNzwHpM9kwhiU+eZ8FqRSZHf8vVOo9dNhj+TszlpHC+Zd0d7V
```

Matcher

Transaction Details

+vb6lIEvOT2C/C6/phdaEmcOOchrjvhSbGv+HnCnHrM=

Received in Matcher → Signatures Collected → Sent to Dispatcher

Status: SENT FOR DISPATCHER
Created 6h ago (9/2/2025, 1:14:35 PM UTC)

Signatures

Matcher 3 of 3

Signer	Signed	Age
Node A	✓	6h ago
M...rE0mzf/PaPtLpmyadQAXFeVGY0BgJYqD8go1...	✓	6h ago
M...rMQaSnhsSWc5h7KsN7aW0BM4pljZuDdwNQWT...	✓	6h ago

Services Signatures Completed

Signatures Root:

Signer	Signed	Age
matcher	✓	6h ago

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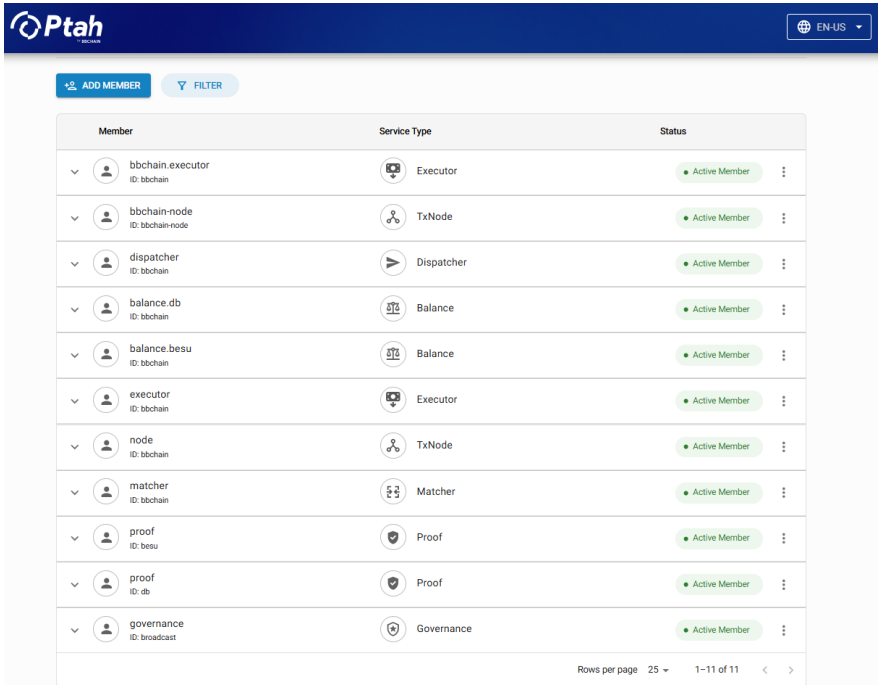
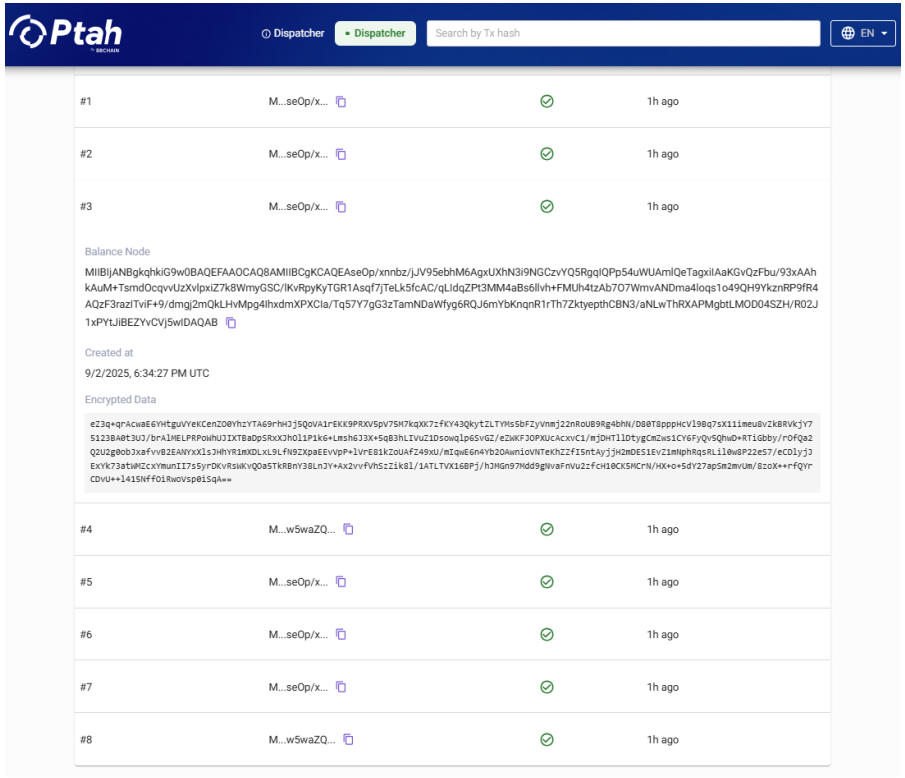
Ptah Explorer

Governance



Dispatcher



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BBCHAIN Blockchain & Digital Assets

Blueprint

	Storage	Service Constrain	Interconection Layer	Infrastructure Participant
Transaction Node		Matcher | Dispatcher		
Balance Node		Matcher | Dispatcher		
Governance Service		-		
Dispatcher Service		Matcher | Uniqueness | Balance | Transaction Node		
Matcher Service		Dispatcher | Uniqueness | Balance | Transaction Node		
Uniqueness Service		Balance | Matcher | Dispatcher		
Proof of Transactions		-		

Public Network

Permissioned Network

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BBCHAIN

Blockchain
& Digital Assets

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Obrigado!

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SÃO PAULO:
Av. Juscelino Kubitschek, 1327 - 4º andar - Conjunto 41 CV 1152
Itaim Bibi - CEP: 04543-011 - São Paulo / SP
+55 (11) 5225-8138 - contato@bbchain.com.br

INOVABRA HABITAT:
Rua da Consolação, 2302 - 7º andar - Sala 07-109
Consolação - CEP: 01301-000 -São Paulo / SP

RECIFE:
Rua Cais do Apolo, 222 - 13º
CEP: 50030-230 - Recife Antigo Recife/PE
+55 (81) 3134-5205

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